

REMARKS/ARGUMENTS

Claims 1-14 are in the application. The Examiner has rejected claims 1, 2, 4, 6, 9, 10, 12, 13, and 14 under 35 U.S.C. § 103(a) as unpatentable over cited prior art, House et al. 4,365,306, and Baziw 5,177,709. Claims 3, 5, 7, 8 and 11 are considered allowable by the Examiner if rewritten to include parent claim limitations.

Obviousness Rejections Under 35 U.S.C. § 103(a):

Claims 1, 2, 4, 6, 9, 10, 12, 13, and 14 under 35 U.S.C. § 103(a) as unpatentable over cited prior art, House et al. 4,365,306, and Baziw Gao et al 5,177,709.

Claims 1, 9, 11, and 14 have been amended for clarity.

The claims as now amended clarify that invention is directed to apparatus and methods for determining the depth of an existing shaft. Applicant considers this to be a clarification of the claims rather than a narrowing, since no one would measure the depth of a structure as they drove it into the ground – they would already know its depth. Depth measurements are made in the case of preexisting structures whose depth isn't known.

The applicant traverses Examiner's claim that "House teaches similarly monitoring the depth of pile (shaft) during a pile driving operation." Rather, House et al. teaches "an apparatus for remotely monitoring and evaluating a pile driving hammer as it drives a pile into a supporting structure." (See Col. 2, lines 49-51). Specifically, the invention computes "the number of times the pile driving hammer strikes the pile during a predetermined time period." (Col., lines) This is called the "blow rate" in House et al. "Once the blow rate has been calculated, it is output to display means 56." (Col. 7, lines 29-30).

The House et al. invention can also count the number of blows over a predetermined distance driven, but the remote sensor is counting blows, not measuring distance. "For example, the switch means 88 can be actuated at a

selected starting time and then reactivated each time the pile 10 is driven a selected distance, such as one foot.” (Col. 6, lines 64-67).

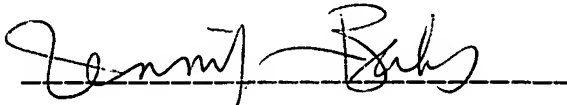
It is not necessary to measure driven depth – the pile driver operators know the driven depth because they are operating the pile driver equipment concurrently. Nor does the invention of House et al. have the capability to measure depths. See Figure 2, which includes only blow rate computation circuitry.

Hence, House et al. does not teach or suggest measuring the depth of a preexisting shaft while driving a cone containing the transducer and periodically striking the shaft, as is taught and claimed in the present invention. In addition, neither cited prior art nor Baziw (nor other prior art known to the applicant, alone or in combination) teach this invention. Baziw is an example of a cone penetrometer used to collect seismic data and test soil conditions “because such measurements provide insight into the response of soil to imposed loads” and the analyzed data “are used to predict settlement, liquefaction and failure.” (Col. 1, lines 24-30).

Independent claims 1, 9, and 14 are patentable for the reasons described above. The other claims are patentable as depending on an allowable claim, and also include additional patentable elements.

As all of the claims now in the application appear to be in condition for allowance, applicant respectfully requests that the application be allowed and passed to issue as soon as possible.

Respectfully submitted,
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